

WHAT IS CLAIMED:

1. A method for detecting the presence or amount of an analyte in a sample comprising:

contacting a surface of a solid support with the sample; and

5 detecting analyte on the surface of the solid support;

wherein the surface of the solid support comprises a bioconjugate of a polypeptide and a polysaccharide and wherein the polypeptide of the bioconjugate is capable of interacting with the analyte.

2. The method of Claim 1, wherein the polypeptide of the bioconjugate is capable of binding to the analyte.

3. The method of Claim 1, wherein the analyte is selected from the group consisting of an antibody, an immunoglobulin, an enzyme, and a hormone.

4. The method of Claim 1, wherein the analyte is an antibody and wherein the polypeptide comprises an antigenic determinant of the antibody.

15 5. The method of Claim 1, wherein the solid support is a membrane or an assay plate.

6. The method of Claim 1, wherein the solid support is an ELISA plate.

7. The method of Claim 4, wherein the polypeptide comprises the amino acid sequence of peptide-T (SEQ ID NO:1) or peptide-26 (SEQ ID NO:2).

20 8. The method of Claim 1, wherein the polysaccharide is a hyaluronic acid or a hyaluronic acid analogue.

9. The method of Claim 4, wherein detecting comprises:

contacting the surface of the solid support with a secondary antibody which binds to the analyte; and

detecting the secondary antibody.

10. The method of Claim 9, wherein the secondary antibody is labeled.

11. The method of Claim 10, wherein the secondary antibody is labeled with an enzyme label or a fluorescent label.

5 12. The method of Claim 1, wherein a plurality of bioconjugates each comprising a polypeptide having a different amino acid sequence are deposited in different discrete regions on the surface of the solid support.

13. The method of Claim 1, further comprising:

 washing the solid support surface after contact of the solid support surface
10 with the sample and before contact of the solid support surface with the secondary antibody.

14. The method of Claim 1, further comprising:

 washing the solid support surface after contact of the solid support surface
with the secondary antibody and before detection; and/or
15 washing the solid support surface after depositing the bioconjugate on the solid support and before contact with the sample.

15. A method of making a polypeptide bioconjugate comprising:

 reacting a polysaccharide with a first linker compound having at least two
carboxylic acid reactive groups such that one carboxylic acid reactive group of the
20 first linker compound reacts with a carboxylic acid group of the polysaccharide;

 reacting the resulting reaction product with a dicarboxylic acid such that a
carboxylic acid group of the dicarboxylic acid reacts with the remaining carboxylic
acid reactive group of the first linker compound; and

 reacting a polypeptide comprising a free amino group with the resulting

reaction product such that the free amino group reacts with the remaining carboxylic acid group of the dicarboxylic acid residue to form the polypeptide bioconjugate.

5 16. The method of Claim 15, wherein the first linker compound is a diamine.

17. The method of Claim 16, wherein the diamine is an alkane diamine.

18. The method of Claim 16, wherein the diamine is diaminoethane.

19. The method of Claim 15, wherein the dicarboxylic acid is succinic anhydride.

10 20. The method of Claim 15, wherein each reaction is conducted under acidic conditions.

21. The method of Claim 15, wherein each reaction is conducted at a pH of 4.5 to 7.

15 22. The method of Claim 15, wherein each reaction is conducted at a pH of about 5.

23. The method of Claim 21, wherein each reaction is conducted in the presence of EDC.

24. The method of Claim 15, wherein the polypeptide is peptide-T amide (SEQ ID NO:1).

20 25. The method of Claim 15, wherein the polysaccharide is a hyaluronic acid or a hyaluronic acid analogue.

26. A bioconjugate made by a method as set forth in Claim 15.

27. A bioconjugate comprising a polysaccharide covalently linked to a polypeptide, wherein the polypeptide comprises the amino acid sequence of one of SEQ ID NOS:2-22.

28. The bioconjugate of Claim 27, wherein the polypeptide comprises the amino acid sequence of peptide-T (SEQ ID NO:1) or peptide-26 (SEQ ID NO:2).

29. The bioconjugate of Claim 27, wherein the polysaccharide is a hyaluronic acid or a hyaluronic acid analogue.

30. An article of manufacture comprising a bioconjugate as set forth in Claim 26 disposed on a surface of a solid support.

31. The article of manufacture of Claim 27, wherein the solid support is a membrane or an assay plate.

32. The article of manufacture of Claim 27, wherein the solid support is an ELISA plate.

33. A method of making a polypeptide bioconjugate comprising:
reacting a polysaccharide with a dihydrazide such that a hydrazide group of the dihydrazide reacts with a carboxylic acid group of the polysaccharide to form a first reaction product;

reacting the first reaction product with a linker compound comprising an amino reactive functional group and a thiol reactive functional group such that the amino reactive group of the linker compound reacts with the remaining hydrazide group of the dihydrazide to form a second reaction product;

reacting a polypeptide comprising a sulfhydryl group with the second reaction product such that the free sulfhydryl group reacts with the remaining thiol reactive group of the linker compound residue to form the polypeptide bioconjugate.

5 34. The method of Claim 33, wherein the reaction of the polysaccharide with the dihydrazide is conducted at a pH of 4.5 to 7.

35. The method of Claim 33, wherein the reaction of the polysaccharide with the dihydrazide is conducted at a pH of about 5 and in the presence of EDC.

10 36. The method of Claim 33, wherein the dihydrazides is adipic dihydrazide.

37. The method of Claim 33, wherein the linker compound comprising an amino reactive functional group and a thiol reactive functional group is selected from the group consisting of sulfo-LC-SMPT, LC-SMPT, SPDP (N-succinimidyl 3-(2-pyridyldithio)propionate) and SMCC (N-succinimidyl-4-(N-
15 maleimidomethyl)cyclohexane-1-carboxylate).

38. The method of Claim 33, wherein the linker compound comprising an amino reactive functional group and a thiol reactive functional group is Sulfo-LC-SMPT.

39. A bioconjugate made by a method as set forth in Claim 33.

20 40. An article of manufacture comprising a bioconjugate as set forth in Claim 39 disposed on a surface of a solid support.

41. The article of manufacture of Claim 40, wherein the solid support is a membrane or an assay plate.

42. The article of manufacture of Claim 40, wherein the solid support is an ELISA plate.

43. A bioconjugate comprising a polypeptide residue conjugated to a polysaccharide residue by a linker moiety wherein the linker moiety comprises the residue of: a diamino compound; a dihydrazide compound; a reaction product of a
5 diamino and a dicarboxylic acid compound; and a reaction product of a dihydrazide and a compound comprising an amino reactive functional group and a thiol reactive functional group.

44. An article of manufacture comprising a bioconjugate as set forth in
10 Claim 43 disposed on a surface of a solid support.

45. The article of manufacture of Claim 44, wherein the solid support is a membrane or an assay plate.

46. The article of manufacture of Claim 44, wherein the solid support is an ELISA plate.